

Drought in Nevada



The background of the slide is a photograph of a vast, arid landscape. The foreground is a dry, cracked mud flat. In the distance, a range of mountains is visible under a clear blue sky with a few wispy clouds. The title "BLM's Mission" is centered in the upper half of the image in a bold, yellow, serif font.

BLM's Mission

To sustain the health, diversity,
and productivity of the public
lands for the use and enjoyment
of present and future generations.

What is Drought?

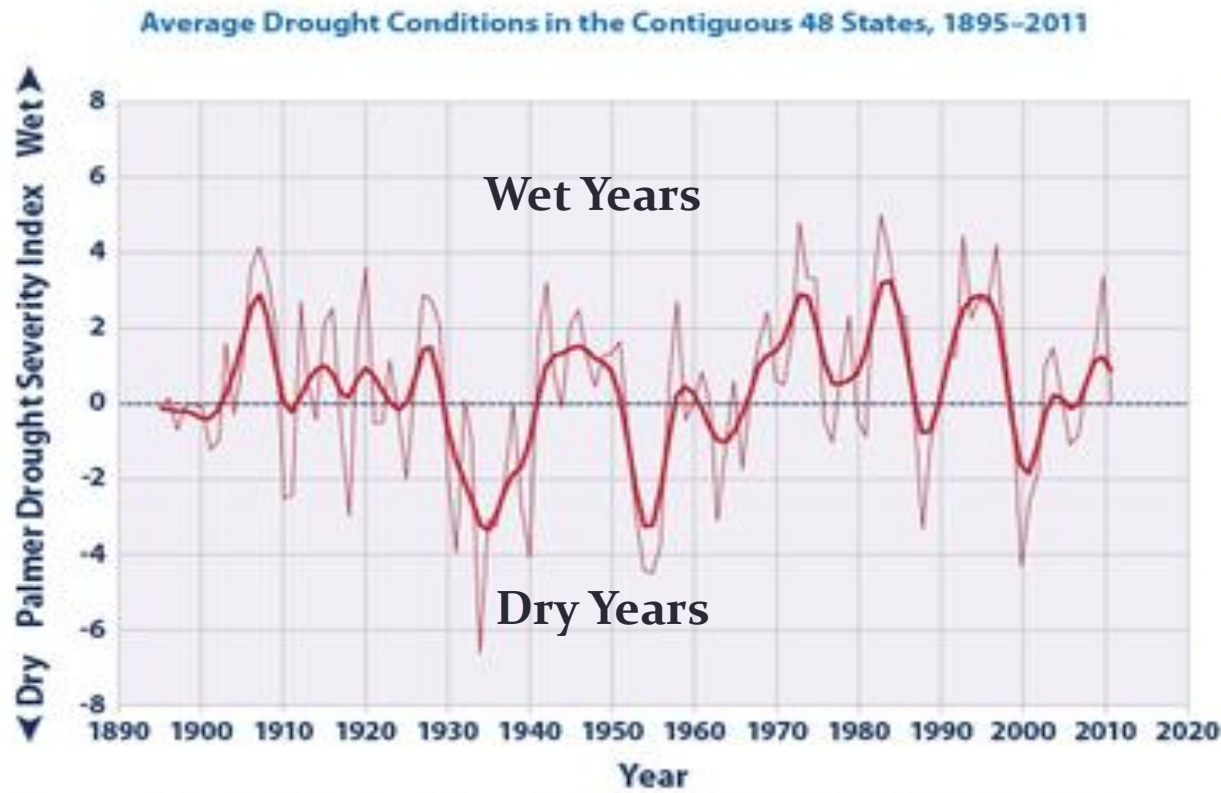
Drought has been defined by the Society of Range Management as:

“(1) A prolonged chronic shortage of water, as compared to the norm, often associated with high temperatures and winds during spring, summer, and fall.

(2) A period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water.” (Bedell 1998)



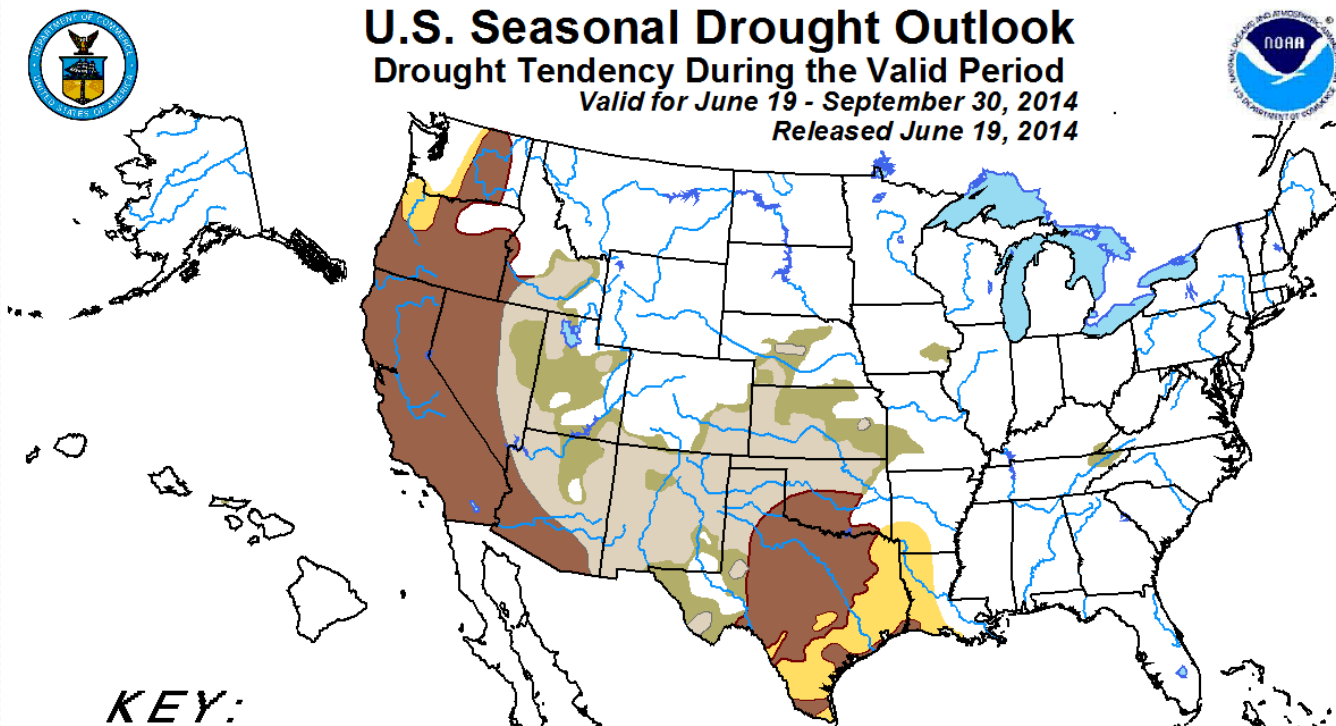
Drought is part of the climate cycle and must be included in planning







Data source: NOAA (National Oceanic and Atmospheric Administration). 2012. National Climatic Data Center. Accessed January 2012. www.ncdc.noaa.gov/oa/ncdc.html.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climatechange/indicators.

Drought Prediction



KEY:

-  Drought persists or intensifies
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely

Author: David Miskus, Climate Prediction Center, NOAA

http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity).

For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain.

The Green areas imply drought removal by the end of the period (D0 or none)

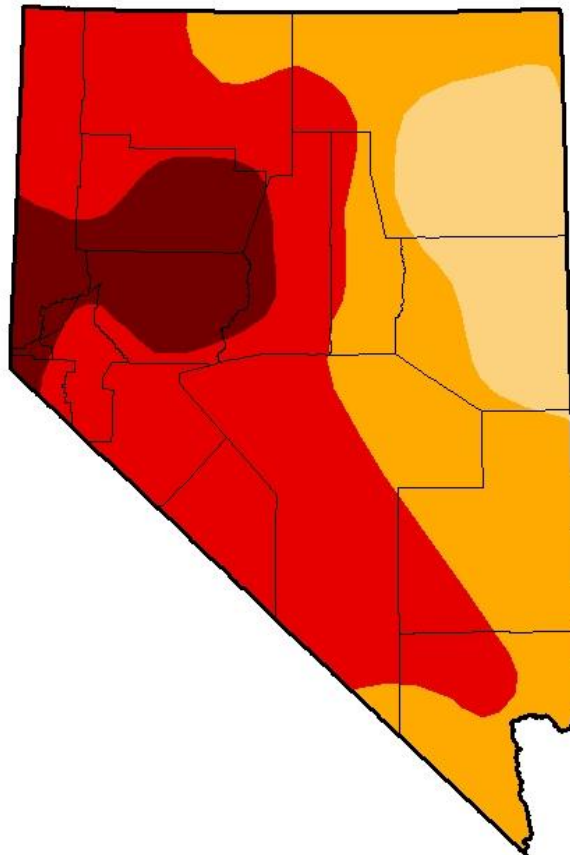
Determining Current Conditions

- U.S. Drought Monitor
- Vegetation Drought Response Index, “VegDRI”
- Western Regional Climate Center
- Great Basin Weather & Climate Dashboard
- Local information and monitoring (field visits)



Drought Monitor

U.S. Drought Monitor Nevada



August 19, 2014

(Released Thursday, Aug. 21, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	86.92	55.21	11.89
Last Week 8/12/2014	0.00	100.00	100.00	86.92	55.21	11.89
3 Months Ago 5/20/2014	0.00	100.00	100.00	87.03	38.73	8.24
Start of Calendar Year 1/23/2013	0.39	99.61	96.81	77.66	28.55	5.37
Start of Water Year 10/1/2013	0.39	99.61	96.79	79.11	28.55	5.37
One Year Ago 8/20/2013	0.00	100.00	100.00	90.11	42.65	5.37

Intensity:

D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought
D2 Severe Drought	

*The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.*

Author:

Richard Tinker

CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

Category	Description	Possible Impacts	Ranges					Objective Short and Long-term Drought Indicator Blends (Percentiles)
			Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)		
Do	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30	
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20	

Great Basin Weather & Climate Dashboard

- One-stop site for climate and drought data in the Great Basin (www.gbdash.dri.edu)
- Current conditions, forecasts and drought planning resources
- Most of the current conditions data is in graphical format



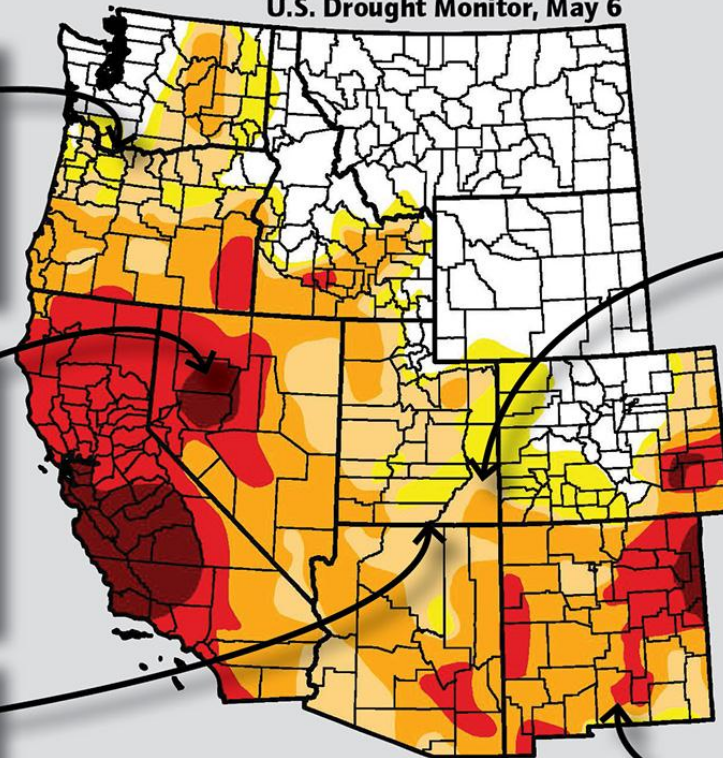
Drought crosses all boundaries

In Oregon's **Klamath Basin**, the remaining snowpack holds only 18 percent of its normal moisture. Meanwhile, parts of eastern Idaho and western Montana are enjoying larger than usual snowpacks.

All of **Nevada** is in drought, with the northwest suffering most. The Nevada Department of Wildlife stocked rivers and lakes with trout weeks earlier than it has in decades, before they dry out too much to support the fish.

This year, **Lake Powell** on the Colorado River is releasing less water than ever to Lake Mead, which supplies Nevada, Arizona, southern California and Mexico. Mead water users are currently receiving their full allotments, but could see cuts as soon as 2016.

U.S. Drought Monitor, May 6



Drought intensity

- | | |
|------------------|---------------------|
| Abnormally dry | Extreme drought |
| Moderate drought | Exceptional drought |
| Severe drought | |

Though much of **Utah** saw prolific winter snowfall, the southern end of the state will have less than half its normal runoff. In Monticello, groundwater wells were drilled to supplement an extremely low reservoir.

With spring runoff predicted to be 8 percent of normal, **southern New Mexico's Elephant Butte Irrigation District** is cutting farmers' water. In May, extra water was released from a northern New Mexico reservoir to trigger spawning among endangered Rio Grande silvery minnows, whose habitat has dried up in recent years.

Drought Affects Plants

- Plants need stored energy to survive winter, and for initial spring growth.
- Plants need more stored energy when summer drought is added.
- Spring growth that is stopped by drought or frost reduces the plant's energy reserves and reduces forage production for next year.

Root Depth Matters

Shrubs usually have deeper root systems, which helps them survive drought

Grasses have shallower root systems

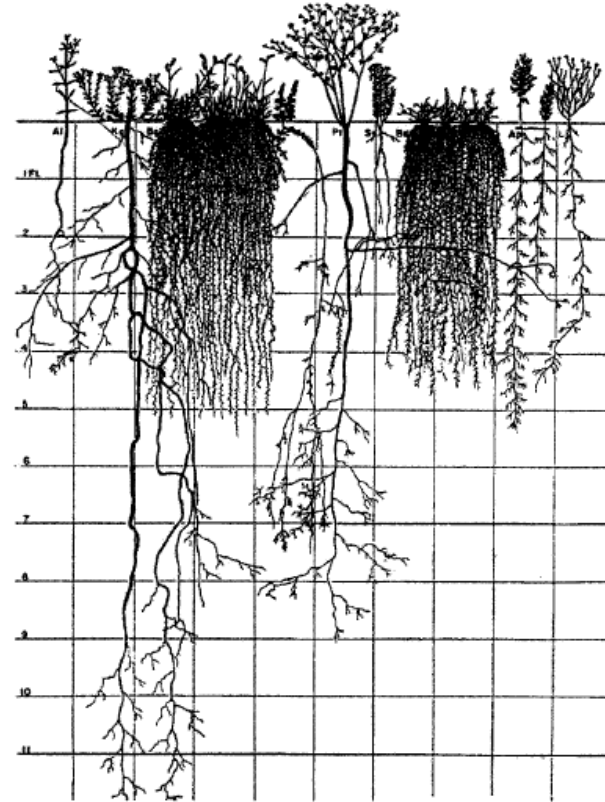


Figure 2. Roots of different grassland plants draw their moisture from different soil layers (Stefferd 1948). Roots of some native plants extend to depths of 20 feet or more. Al, narrow-leaved 4-o'clock (*Allionia linearis*); Kg, prairie false boneset (*Kuhnia gultinosa*); Bg, blue grama (*Bouteloua gracilis*); Mc, globemallow (*Malvastrum coccineum*); Pt, a legume (*Psoralea tenuiflora*); Ss, (*Sideranthus spinulosus*); Bd, buffalo grass (*Buchloe dactyloides*); Ap, western ragweed (*Ambrosia psilostachya*); and Li, skeleton weed (*Lygodesmia juncea*).

Drought Affects Wildlife

With reduced food, water, and cover, wildlife concentrates at water sources, degrading habitats



Drought and Animal Health

Less food means fewer animals breed, disease risk increases, and even fewer will survive the winter

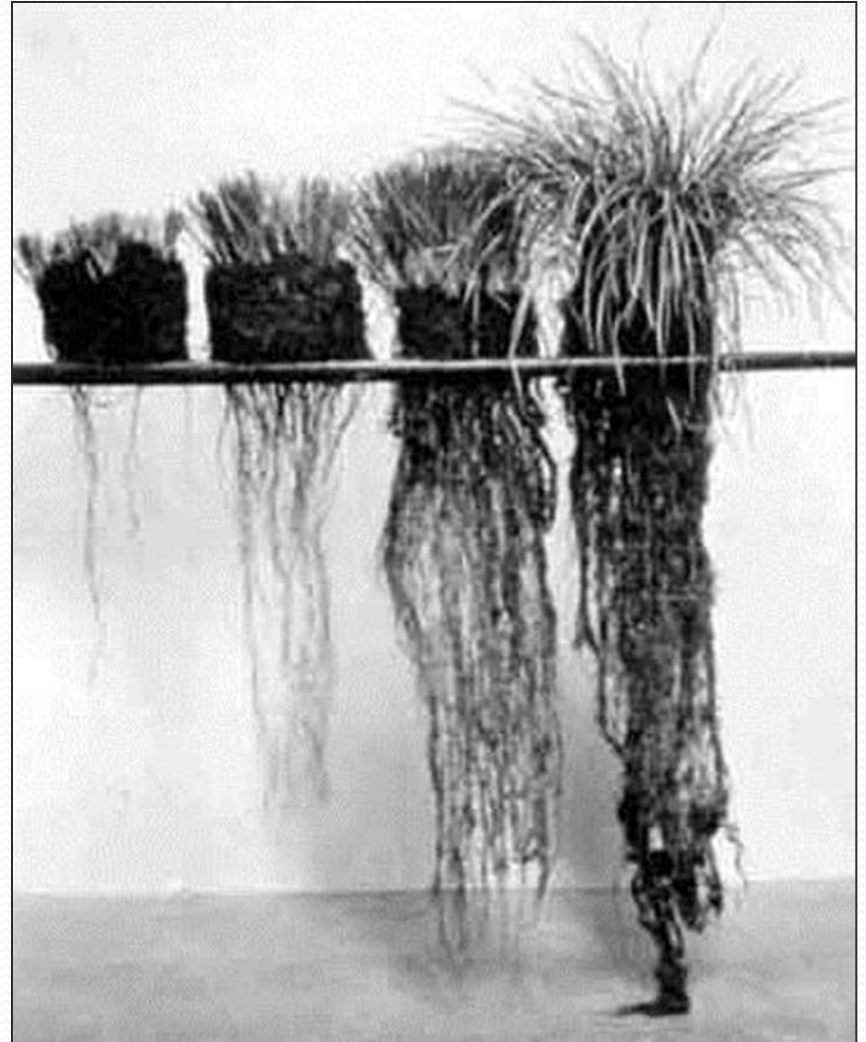


Increased conflicts between wildlife and humans



Grazing and Drought

- Grazing removes plant cover and plant litter, increasing the drying effect and worsening drought conditions.
- Plants in a weakened state may die or not survive winter.



Grazing and Drought

Drought + Overgrazing = Loss of desirable plants and increase in undesirable plants



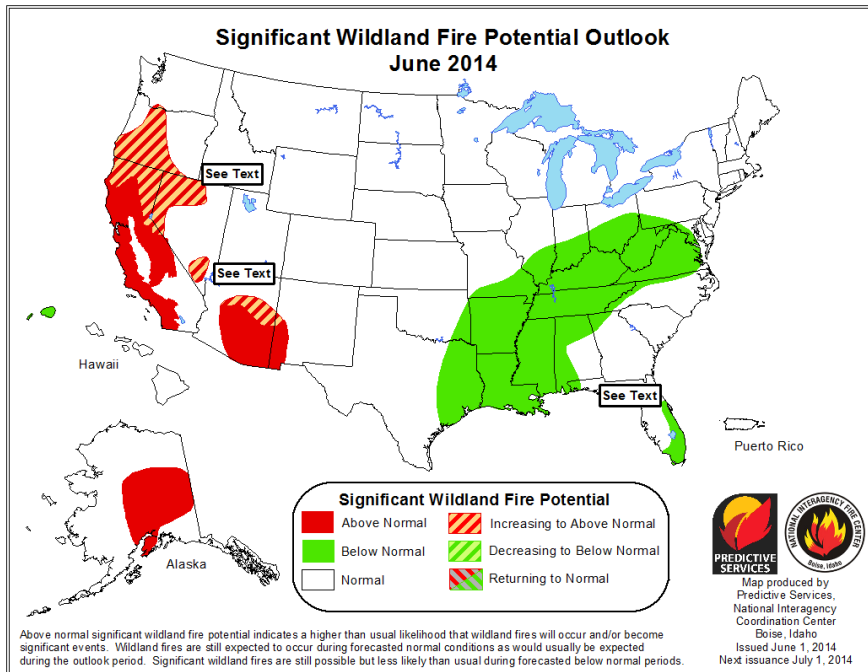
Non-native plants tolerate severe droughts but have poor forage value and dominate open spaces when native plants disappear.

Rangelands & Drought

Long-term Effects:

- All rangelands are affected by drought, regardless of starting condition
- Rangeland in fair or poor condition is more affected and recovers more slowly than rangeland in good or excellent condition
- Grazing of any kind adds to the negative effect of drought
- Plant species composition can shift, resulting in loss of desirable native perennial species
- Future droughts can have more severe effects

Drought: Fire Risk Increases



BLM NV DROUGHT POLICY

- The BLM NV Drought Handbook (2011) requires that we manage for drought before, during, and after drought.
- WO IM-2013-094 – Resource Management During Drought provides direction nation-wide.
- The Nevada District Drought Environmental Assessments were based on the NV Drought Policy.
- NV IM-2014-004 – Grazing Applications for Non-Use During Drought/Voluntary Livestock Grazing Drought Management Agreements

What's Your Priority?



Prioritizing Management During Drought

Highest Priorities are the condition of:

- Horse Management Areas
- Greater sage-grouse habitat
- Riparian Areas
- Native Plant Communities

BLM Drought Management

BLM Nevada has pre-determined:

- Drought Indicators
- Drought Response Triggers
- Drought Response Actions

What are Drought Indicators?

Drought indicators are observations signaling the start or continuation of a drought.

- U.S. Drought Monitor
- Vegetation Drought Response Index, “VegDRI”
- Western Regional Climate Center
- Great Basin Weather & Climate Dashboard
- Local information and monitoring (field visits)

What Are Drought Response Triggers?

Drought Response Triggers (Triggers) are thresholds associated with forage and water resources that indicate the need for site-specific drought response.

- **Water Availability**
 - Presence or absence of water
- **Forage**
 - Utilization and Stubble Height
 - Wild Horse and Burro Body Condition
 - Plant Production and/or Drought Stress

Wild Horses and Burros

Fish Lake Valley



Gold Mountain



Removal (bait, water, or helicopter trapping), temporary water hauls, supplemental feeding in a Horse Management Area, relocation, emergency gathers.

Drought Response Actions

Livestock Actions

- Seek voluntary nonuse
- Partial closure of allotments
- Complete closure of allotments
- Partial reduction in AUMs
- Change in season of use
- Reduced grazing duration
- Change in livestock management practices
- Fencing of critical areas
- Targeted grazing of invasive annual dominated communities
- Changes in kind or class of livestock
- Water hauls and above ground pipelines



Drought Should Be No Surprise

- BLM Nevada plans for drought
- We monitor pre-set indicators
- We have pre-determined triggers
- We have a consistent state-wide approach for management actions
- Our plan is to keep working lands working, for people and for nature, for ever and ever.



Created by:

- Todd Hopkins, Great Basin LCC
- Kathryn Dyer, BLM NV
- Sarah Peterson, BLM NV
- Doug Furtado, BLM Battle Mountain
- Adam Cochran, BLM Battle Mountain